

Erin Ellefsen

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Education

- August 2022 **PhD in Applied Mathematics**, *University of Colorado Boulder*, GPA 3.9
December 2020 **Masters of Science in Applied Mathematics**, *University of Colorado Boulder*, GPA 3.9
May 2017 **Bachelors of Arts, Mathematics, Minor in Computer Science**, *Luther College*, GPA 3.9

Teaching Experience

Fall 2024 - Present **Assistant Professor of Mathematics**, *St. Olaf College*

- MATH 330, Differential Equations II, Fall 2024, Spring 2025
- MATH 230, Differential Equations I, Fall 2024, Spring 2025

2022 - 2024 **Assistant Professor of Mathematics**, *Earlham College*

- MATH 330, The Art and Science of Mathematical Modeling, Spring 2023
- MATH 320, Differential Equations, Fall 2022, Fall 2023
- MATH 300, Mathematical Statistics, Fall 2022, Fall 2023
- MATH 180, Calculus A, Spring 2023
- MATH 120, Elementary Statistics, Spring 2023
- ESEM 150, Don't Get Duped: *Reasoning Mathematically in an age of digital lies*, Fall 2023

2018-2019 **Lead Teaching Assistant**, *University of Colorado Boulder*

Attended Lead TA training, led a year-long teaching and research seminar for first year graduate students, performed Video Teaching Consultations for Teaching Assistants within and outside of the department, completed a year-long video project for the Center for Teaching and Learning.

2017-2021 **Graduate Teaching Assistant**, *University of Colorado Boulder Mathematics Department*

Led weekly recitations for undergraduates, held weekly office hours, created homework rubrics, led exam review sessions, graded homeworks and exams, wrote homework solutions.

- APPM 1350, Calculus I for Engineers, Summer 2018, Fall 2018
- APPM 1360, Calculus II for Engineers, Fall 2017, Spring 2018
- APPM 2360, Differential Equations, Fall 2019, Fall 2021
- APPM 4440, Applied Analysis, Fall 2020
- APPM 3570, Applied Probability, Spring 2021

Fall 2019 **Grader**, *University of Colorado Boulder Applied Mathematics Department*

Graded homework for APPM 5470: Partial Differential and Integral Equations, a graduate course covering properties and solutions of partial differential equations: methods of characteristics, well-posedness, wave, heat, and Laplace equations, Green's functions and related integral equations.

Research Experience

- 2024 - Present **Mathematical Biology Research Group, St. Olaf College**
We are using PDEs and ODEs to understand how diffusion strategies affect persistence of a population under environmental disturbance, drift, and habitat fragmentation. This project incorporates experimental data on habitat fragmentation.
- 2022 - 2024 **Mathematical Biology Research Group, Earlham College**
Of interest is a nonlocal systems of PDEs. These are used to study territory development and management strategies of invasive species. A system of ODEs is used to study the dynamics of a fish population with enhanced female cannibalism. The latter is a project that involves undergraduate students.
- 2018- 2022 **Graduate Research Assistant, University of Colorado Boulder**
A system of nonlocal PDEs with cross diffusion was used to model territory formation in meerkats. Equilibrium solutions were used to incorporate data into the model. Developed theory for a nonlocal PDE modeling a birth-jump process that can be used to model fire propagation, cancer cell growth, or seed germination.

Publications

- 2023 Erin Ellefsen, Nancy Rodríguez; *"Nonlocal Mechanistic Models in Ecology: Numerical Methods and Parameter Inference"*, Applied Sciences, 2023
- 2021 Erin Ellefsen, Nancy Rodríguez; *"On equilibrium solutions to nonlocal mechanistic models in ecology"*, Journal of Applied Analysis and Computation, 2021
- 2020 Erin Ellefsen, Nancy Rodríguez; *"On some theory of monostable and bistable pure birth-jump integro-differential equations"*, Ecological Complexity, 2020
- 2019 Allison Arnold-Roksandich, Brian Diaz, Erin Ellefsen, Holly Swisher; *"Extending a catalog of mock and quantum modular forms to an infinite class"*, Research in Number Theory, 2019.

Selected Presentations

- "Two-species competition with p -Laplacian diffusion"**
Spring 2025 AWM Research Symposium, Madison, WI
- "Models in Mathematical Ecology: Territory Development, Seed Dispersal, and Invasive Species Management"**
Fall 2024 Hamline University Mathematics Colloquium, Minneapolis, MN
Fall 2023 Earlham College Biology Colloquium, Earlham College, Richmond, IN
- "Nonlocal PDEs in Ecology: Numerical Methods and Parameter Inference"**
Fall 2023 Annual Mathematics Conference, Miami University, Oxford, OH
- "Nonlocal Models in Ecology"**
February 2021 Florida Women in Mathematics Day, Florida Atlantic University, Virtual
Spring 2021 Applied Mathematics Graduate Recruitment, University of Colorado Boulder, Virtual
Fall 2021 Mathematical Biology Seminar, University of Colorado Boulder, Virtual
- "Efficiently Finding Steady States of Nonlocal Territorial Models in Ecology"**
Spring 2022 SIAM PD22: Recent Advances in Cross-Diffusion and Population Models, Virtual
Fall 2021 Differential Equations of Mathematical Physics and their Applications, Como, Italy
Fall 2021 Mathematical Biology Seminar, University of Iowa, Virtual
July 2021 Mathematical Congress of the Americas, Virtual Poster
March 2020 Front Range Student Conference in Applied Math, University of Colorado Denver, Denver, CO

Fall 2019 Mathematical Biology Seminar, University of Colorado Boulder, Boulder, CO

"Nonlocal Territorial Models in Ecology"

September 2019 Annual Mathematics Conference, Miami University, Oxford, OH

Spring 2019 Applied Mathematics Graduate Recruitment, University of Colorado Boulder, Boulder, CO

Professional Development

June 2025 **MSCS Professional Development Participant and Peer Leader**

Participated and helped with one session of a departmental professional development series aimed at using technology such as GitHub and PreTeXt.

January 2024 **Special session co-organizer for Joint Math Meetings**

Co-organizing a special session about alternative assessment methods, in particular Team Based Inquiry Learning, with two colleagues via Project NExT.

Fall 2023 **Math Modeling Hub's COMPOSTE workshop**

A series of two-hour virtual workshops designed to help adapt old M3C, HiMCM, MCM/ICM, and SCUDEM contest problems into engaging lesson plans and modules at the undergraduate level

2023-2024 **SIAM Project NExT (New Experiences in Teaching) Fellow**

A professional development program for recent Ph.D.s in the mathematical sciences which addresses all aspects of an academic career: improving the teaching and learning of mathematics, engaging in research and scholarship, finding exciting and interesting service opportunities, and participating in professional activities. It provides the participants with a network of peers and mentors as they assume these responsibilities.

Spring 2023 **General Education Learning Circle Participant, Earlham College**

Participating faculty met five times in Fall 2022 and Spring 2023 to discuss assessment, including best practices, various approaches, and what assessment means at Earlham. As part of this learning circle, we produced a worksheet intended to help match assessment plans to a specific learning goal, to consider both direct and indirect measures, to provide an interpretation of the results, and to use the results to inform pedagogical choices.

February 2023, 2025 **SIMIODE Expo Attendee**

A conference for faculty, students, and other parties interested in using modeling to motivate, teach, and learn differential equations.

Spring 2021 **Certificate of College Teaching, University of Colorado Boulder**

Completed my requirements to get my Certificate of College Teaching which include 20 hours of teaching workshops, 20 hours of discipline-specific training, two Video Teaching Consultations, a faculty evaluation, and a teaching portfolio.

Research Support

In Progress 2025 Rana Parshad, Erin Ellefsen, Bo Zhang; *Managing Competition Dynamics under Fragmentation for Enhanced Invasion Control*, NSF Mathematical Biology.

- Competitive federal program that supports research in areas of applied and computational mathematics relevant to the biological and life sciences.

2025 Erin Ellefsen; *Using Differential Equations to Model Invasive Species Management*, St. Olaf College Collaborative Undergraduate Research and Inquiry Program.

- Internal funding program that supports summer research experiences for undergraduates.

2023 Erin Ellefsen; *Using Differential Equations to Investigate Invasive Species Management and Cyclical Mating Dynamics*, Earlham College Summer Collaborative Research.

- Internal funding program that supports summer research experiences for undergraduates.

Service and Community Engagement

- 2024-2025 MSCS Talks Committee Member, St. Olaf College, Northfield, MN
- Spring 2025 Search Committee Member for a VAP in Mathematics, St. Olaf College, Northfield, MN
- Fall 2025 Keynote speaker for MSCS Colloquium, St. Olaf College, Northfield, MN
- 2024-2025 Faculty Representative for SIAM and AWM clubs, St. Olaf College, Northfield, MN
- 2023-2024 Volunteer Cross Country Coach, Earlham College, Richmond, IN
- 2023-2024 Faculty Member on Student Conduct Council, Earlham College, Richmond, IN
- 2022-2024 Re-Launched Earlham's Chapter of Association for Women in Mathematics
 - Association of Women in Mathematics (AWM) is a group for gender-minorities in mathematics. Planned activities have included: AWM lunches in the dining hall several times a semester, weekend pizza gatherings, an AWM bowling event, and a career panel.
- AY 2022-2023 Assisting Volleyball Graduate Assistant with team statistics
 - Attended various meetings with Cal Pringle to share statistics expertise in regards to volleyball data, guide possible analyses that will help advise training, and share data that could possibly be used as examples and projects in the statistics classroom.
- Spring 2023 Assisted in writing and grading the Mathematics Department's comprehensive exams
- Spring 2023 Late Night Breakfast Volunteer Server
- Spring 2023 Search Committee Member for Biology's Quantitative Plant Ecologist
- 2018 - 2021 Volunteer Cross Country & Track Coach, Standley Lake High School, Westminster, CO

Technical Skills

MatLab, Python, Mathematica, limited experience with PETSc

Scholarships and Awards

- 2023-2024 **SIAM Project NExT Fellow**
- 2017-2020 **R.J McElroy Fellowship**
- May 2017 **Phi Beta Kappa**
- 2013-2017 **Dean's List, Luther College**
 - Carl Strom Prize in Mathematics, Luther College**
 - Women in Math & Statistics Scholarship, Luther College**
 - Ann Lee Moilien Memorial Math Scholarship, Luther College**
 - Cory L. Braun Memorial Math Scholarship, Luther College**
 - Paul G. And Hazel H. Hoel Math Scholarship, Luther College**

Professional Memberships

Mathematical Association of America
Association of Women in Mathematics
Society of Applied and Industrial Mathematics